PAPERS

IN

AGRICULTURE.

No. I.

MANURES.

The Thanks of the Society were voted to Mr. W. H. B. WEBSTER, Surgeon, R.N., Carr Street, Ipswich, for the following Paper on Coal-dust and other Substances to be used as Manures.

ON THE PROBABLE USE OF COAL-DUST AS A MANURE.

THE analogy of the constituent principles of coal, to that of oil or animal matter, led to the idea that it might probably be employed as food for plants; and, when I further reflected that many geologists supposed it to be of vegetable origin, I was strengthened in the opinion. Its destructive distillation, yielding olefiant gas, ammonia, tar, oil, &c., still more strongly corroborated the idea, and I was led to put it into practice and recommend it to others. I shall be very brief, and confine myself entirely to the results of my own observations, leaving entirely and completely out of view the opinions and conclusions of others, some of which were favourable to the views I entertain.

The complete insolubility of coal-dust seems to be the insuperable objection to its utility as a manure; but surely it is not more insoluble than the effete ashes.

I am inclined to believe, from a long continued series of observations, that the slender filamentous radicles of plants have a power in all respects equal, if not superior, to small electro-galvanic wires of low intensity, which, by slow continued action, decompose most substances that are presented to them, and, among others, that of coal-dust. Whatever the vital principle may be, we cannot assign it a lower grade in the scale than that of electro-galvanic influence; and we are not assuming too much for the vital action of the radicles when we claim for them a power equal only to that of small galvanic wires which can and do effect a decomposition of coal-dust.

A multitude of facts seem to confirm this idea; but it is not my intention to enter on this wide field, but simply to strengthen the proposition of coal-dust for manure by fair and rational statements. It is certain that substances, regarded by us as nearly insoluble, are absorbed into plants in large quantities. I have taken great pains, on a small scale, to demonstrate the fact, that coal-dust *is not inimical* to vegetation, by filling a series of garden-pots with fine coal-dust, and planting and sowing a variety of plants therein, as potatoes, onions, &c. &c. In all of them the vegetation was extremely vigorous and luxuriant. I have filled hyacinth glasses with coal-dust, and put bulbs therein, supplying water as required; and the result, when compared to those without the coal-dust, was very marked and evident; large, healthy, strong plants being produced, and admired by many.

I can only say, that those who will fill a box with

coal-dust, and plant potatoes therein, will obtain a good and early crop,—more bountiful and finer than when in common mould under similar circumstances.

Strawberries, onions, and a vast variety of useful and ornamental plants, thrive extremely well indeed in coal-dust.

Coal-dust is remarkably clean and neat, inoffensive without odour or stain, not capable of harbouring insects or maggots, well adapted for in-door floriculture, and enduring for a long period, not consolidating or becoming too hard by frequent watering, and possessing many great advantages.

As coal-dust is so insoluble, it must of necessity be very slow and gradual in its action, diffusing its influence over a long space of time, not coming into action quickly; and, independent of its insolubility, it has very little power of retaining moisture: hence, it is well adapted for those plants that like a light, loose, dry, and sandy soil, with the evident advantage of containing a very large amount of nutriment. Of course, coal-dust requires to be intimately mixed with the lower portion of the soil where the radicles extend, and then its beneficial action will be very perceptible on the crop of potatoes, peas, turnips, or cabbages; indeed, all evidence the fact of its being most useful. I could detail many experiments most satisfactory, but leave the subject with this communication, assuring your Society that truth, reason, and experience, attest the fact to be as I state; and whoever will try it on a small scale, with the knowledge of its being a slow and steady manure of no mean power, will not be disappointed.

But those who may be indisposed to adopt the use of

coal-dust may be induced to try a very excellent combination of coal-tar and slacked lime.

One gallon of coal-tar, mixed up well and completely with one bushel of slacked lime, produces a material of warmth and value as a manure, rich and stimulating, and tending very much to keep away the flies when sprinkled freely in and among the young turnips.

I have used this compound with excellent effect on peas and potatoes, producing an evident and marked effect over the rows where none was used.

Animal tar, or dippel oil, procured from the distillation of bones, and at present I believe a nuisance, if used with slacked lime in the same manner, forms a much richer and more serviceable manure than that of the coal-tar. And thus, products of small importance, cheap and abundant, may be turned to good account in fertilising our soil.

THE NITRATES

Of potash, soda, ammonia, and lime, are all undoubtedly possessed of considerable efficacy as manures.

The nitrate of lime is found in some old mortars, and both nitrate of ammonia and the nitrate of lime exist in the drainings and liquid of the dunghills, or muck-heaps, and to these in some measure is owing the highly fertilising power thereof. Nitrate of ammonia is a beautiful stimulant; and those who wish to excite the growth of favourite plants, may water them with weak solutions—a dram to a pint of water—or use it in the hyacinth glasses in the same way as nitre has been used with such efficacy, in quickening the growth.

OXIDE OF MANGANESE

Has been tried on many occasions: it readily admits of vegetation, and seems to possess the power of rousing and calling into action the dormant and languid vitality of old seeds. If mixed with the soil, it might yield oxygen to the plant, and absorb it again gradually from the air and moisture, so as to remain in the soil unimpaired for ages. It would appear to me to deserve a trial from the results I obtained with it.

Whatever scepticism or ridicule coal-dust may meet with, I have the satisfaction of laying before your honourable Society a specimen which I trust will meet with approbation, and to which I believe no valid or rational objection can be made; and the principle I deem to be one of considerable national importance. I allude to the combination of *quick-lime* with sprats, fish, offal, refuse, blood, &c., and which might be used in a commercial point of view by the whalers and sealers using quick-lime to preserve the flesh and make it into a valuable manureal product, not to be despised in the absence of a better cargo.

The Greenland whalers and the Newfoundland sealers, &c., would afford the means of enormous masses of animal matter being available for manure, the flesh being now thrown away in both cases.

The specimen, marked "Sprat-Lime, No. 1," is a perfect chemical combination of sprats and lime.

3 parts by weight of sprats,
1 part by weight of good quick-lime.

The sprats are smashed or crushed by rollers into a complete pulp, and the whole mass of them carefully and intimately mixed with the quick-lime by trituration. A considerable heat is produced, which tends greatly to the

drying of the sprats, and some ammonia is evolved, especially if they are not fresh. In a few days the material is dry; it is necessary to bear in mind that no artificial heat should be employed, and that they should be turned over once a-day.

Sprat-lime approaches nearest in manureal properties to bone-dust. It is not liable to be attacked by worms or insects, does not come into rapid action at first—the sprats are economised and preserved, and their influence extended over a considerable time, supporting vegetation equably and well for several years I presume. It is not destroyed by birds. The animal matter is not very soluble in sprat-lime, and it is, in well-made specimens, in perfect chemical combination. The proportion of animal matter or fish must not be increased beyond that of three times the quantity of lime employed, otherwise it will be of a very inferior nature and liable to decomposition.

Lime may be regarded in an agricultural point of view as the salt of the earth, and the means of preserving all substances for manureal purposes.

If two parts of fish and one of lime be used, it of course dries the quicker and faster; but then, the bulk of the manure is increased and its value lessened by the diminution of the fish or animal matter.

Three to one seem to be fair and good proportions. It is most important to bear in mind that *quick-lime* is to be employed, and not slacked lime, on account of its already containing its definite quantity of water, and hence its value and efficacy is very much impaired.

The specimen, marked "Sprats and Lime," were sprats put into quick-lime, alternate layers of each, the sprats not being broken. The worm and maggot attacked them, and this mode is inadequate to their perfect preservation.

I have tried blood, flesh, and a variety of substances,

such as the entrails and refuse of fish, which all produce useful and valuable fertilising manures. I appeal to your Society for a verdict, and I leave the subject in your hands, it being foreign to my purpose to pursue it any further. Convinced of their value and importance, I respectfully submit to your decision.

No. II.

AMPUTATION OF THE LARGE BRANCHES OF TREES.

The Thanks of the Society were voted to Mr. HENRY SMITH, *Devonshire Buildings, Bath, for the following Communication respecting a new Mode of Operation and Treatment in Cutting off the Large Branches of Trees.*

THE object of the following process is to provide against the rot which frequently attacks the stumps of branches which have been cut off, and sometimes penetrates into the body of the tree, rendering the timber wholly unfit for being cut into planks.

The branch is cut off at a distance of three or four feet from the tree, care being taken to support it in a manner to prevent it from splintering the stump. The bark of the stump is then cut into narrow longitudinal strips, which, after being carefully peeled off with a barking tool, as far as the body of the tree, are tied back so as to keep them clear of the saw in the ampu-